

10/052,239

2

In the Claims:

Claims 1-5 (Cancelled)

6. (Currently amended) A material having ~~a catalytic surface that has immobilized, or available at the surface thereof, a catalytic agent having nitrite reductase and/or nitrite reductase-like activity, or nitrosothiol reductase activity, the catalytic agent including a macrocyclic ligand which converts nitrite/nitrate or nitrosothiols to nitric oxide when the catalytic surface is in contact with blood, wherein the catalytic agent is a biomimetic catalytic agent.~~

7. (Currently amended) The material of claim 6 wherein the ~~biomimetic~~ catalytic agent is a metal ion ligand complex and wherein the metal ion is capable of reducing one or more of nitrite, nitrate, and nitrosothiols to nitric oxide.

8. (Currently amended) The material of claim ~~7~~ wherein the catalytic agent is a Cu(II) metal ion ligand complex.

9. (Currently amended) A material having a catalytic surface that has immobilized, or available at the surface thereof, a catalytic agent having nitrite reductase or nitrosothiol reductase activity, which converts nitrite/nitrate or nitrosothiols to nitric oxide when the catalytic surface is in contact with blood, wherein the catalytic agent is a Cu(II) metal ion ligand complex, and the ~~The material of claim 8 wherein the Cu(II) metal ion ligand is selected from the group consisting of dibenzo[e,k]-2,3,8,9-tetraphenyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene; dibenzo[e,k]-2,3,8,9-tetramethyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene; and dibenzo[e,k]-2,3,8,9-tetraethyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene.~~

10. (Currently amended) The material of claim 6 wherein the material is at least one ~~selected from the group consisting of polymers, metals~~ a polymer, a metal, an alloy of the metal, or graphite.

11. (Original) The material of claim 10 wherein the material is a polymer.

10/052,239

3

12. (Original) The material of claim 11 wherein the polymer is selected from the group of poly(vinyl chloride), polyurethane, and silicone rubber.

13. (Currently amended) A material having a catalytic surface that has immobilized, or available at the surface thereof, a catalytic agent which is a metal ion ligand complex having nitrite reductase or nitrosothiol reductase activity, which converts nitrite/nitrate or nitrosothiols to nitric oxide when the catalytic surface is in contact with blood, wherein the material is a polymer, and The material of claim 11 wherein the polymer further includes lipophilic salts of nitrite/nitrate or nitrosothiols within the polymer to create a reservoir of nitrite/nitrate or nitrosothiol that can continuously leak to the catalytic surface.

14. (Previously presented) The material of claim 13 wherein the lipophilic salt of nitrite/nitrate is tridodecylmethylammonium nitrite ($\text{TDMA}^+ \text{NO}_2^-/\text{NO}_3^-$).

15. (Original) The material of claim 10 wherein the material is a metal.

16. (Original) The material of claim 15 wherein the metal is selected from the group consisting of stainless steel, nickel, titanium, aluminum, copper, gold, silver, platinum and alloys or combinations thereof.

17. (Currently amended) The material of claim 15 wherein the catalytic agent is covalently attached to the surface of the metal material.

18. (Currently amended) The material of claim 15 wherein the surface of the metal material is coated with a polymeric film having the catalytic agent incorporated into the film or attached to ~~the~~ surface of the polymeric film.

19. (Currently amended) A material having a catalytic surface that has immobilized, or available at the surface thereof, a catalytic agent which is a metal ion ligand complex having nitrite reductase or nitrosothiol reductase activity, which converts nitrite/nitrate or nitrosothiols to nitric oxide when the catalytic surface is in contact with blood, wherein the material is a metal having the

10/052,239

4

surface coated with a polymeric film having the catalytic agent incorporated into the film or attached to a surface of the polymeric film, and The material of claim 18 wherein the polymeric film further includes lipophilic salts of nitrite/nitrate or nitrosothiols within the polymer film to create a reservoir of nitrite/nitrate or nitrosothiol that can continuously leak to the catalytic surface.

20 – 29. (Cancelled)

30. (Currently amended) A medical device comprising:

a material having immobilized, or available at a surface thereof, a metal ion ligand complex, the ligand having a planar square geometry, the metal ion ligand complex capable of a biomimetic catalytic agent having nitrite reductase and/or nitrite reductase like activity, or a nitrosothiol reductase activity, which converts converting nitrite/nitrate or nitrosothiols to nitric oxide when in contact with at least one of a body and body fluids blood.

31. (Previously presented) The medical device of claim 30 wherein the medical device is selected from the group consisting of arterial stents, guide wires, catheters, bone anchors and screws, protective platings, hip and joint implants, spine appliances, electrical leads, biosensors and probes.

32. (Currently amended) The medical device as ~~defined in~~ claim 30 wherein the ~~biomimetic catalytic agent is a metal ion ligand complex wherein the metal ion is capable of reducing one or more of nitrite, nitrate, and nitrosothiols to nitric oxide.~~

33. (Currently amended) The medical device as ~~defined in~~ claim 30 wherein the ~~biomimetic catalytic agent~~ metal ion ligand complex is a Cu(II) metal ion ligand complex.

34. (Currently amended) A medical device comprising:

a material having immobilized, or available at a surface thereof, a Cu(II) metal ion ligand complex having nitrite reductase or nitrosothiol reductase activity, which converts nitrite/nitrate or nitrosothiols to nitric oxide when in contact with blood. ~~The medical device as defined in claim 33 wherein the~~ ligand of the Cu(II) metal ion ligand complex is selected from the group consisting of

10/052,239

5

dibenzo[e,k]-2,3,8,9-tetraphenyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene; dibenzo[e,k]-2,3,8,9-tetramethyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene; and dibenzo[e,k]-2,3,8,9-tetraethyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene.

35. (New) The material of claim 6 wherein the ligand is selected from the group consisting of dibenzo[e,k]-2,3,8,9-tetraphenyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene; dibenzo[e,k]-2,3,8,9-tetramethyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene; dibenzo[e,k]-2,3,8,9-tetraethyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene, and salts thereof.

36. (New) The material of claim 11 wherein the polymer includes lipophilic salts of nitrite/nitrate or nitrosothiols.

37. (New) A complex comprising a metal- N_x -donor macrocyclic ligand or a metal- S_x -donor macrocyclic ligand, where x is selected from 2, 4, 5, 6, and 8, and wherein the complex is capable of reducing at least one of nitrate, nitrite, and nitrosothiols to nitric oxide.

38. (New) The complex of claim 37 wherein x is 4.

39. (New) The complex of claim 37 wherein the metal is selected from the group consisting of Cu(II), Co(II), Ni(II), Zn(II), Mn(II), and Al(II).

40. (New) The complex of claim 37 wherein the metal is selected from the group consisting of Fe(III), V(III), Cr(III), and Ti(III).

41. (New) A complex comprising:

a Cu(II) ion; and

a ligand binding the Cu(II) ion, the ligand being at least one of dibenzo[e,k]-2,3,8,9-tetraphenyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene; dibenzo[e,k]-2,3,8,9-tetramethyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene; dibenzo[e,k]-2,3,8,9-tetraethyl-1,4,7,10-tetraaza-cyclododeca-1,3,7,9-tetraene, and salts thereof.

10/052,239

6

42. (New) A material having available at a surface thereof, a metal ion ligand complex, the ligand having a planar square geometry, the metal ion ligand complex having nitrite reductase or nitrosothiol reductase activity.